

3/30/2006 Response to Office Action
U.S.S.N. 10/807,944

Page 2

REMARKS

The present invention relates to an improved chemical-mechanical polishing (CMP) slurry composition. Claims 1-36 are currently pending. Claims 17-36 are withdrawn from consideration.

Claims 1-16 are rejected under U.S.C. 35 103(a) as allegedly being unpatentable over Small et al. (US 2003/0162398) in view of Sethuraman et al. (US 5,972,124). The Office Action states that Small teaches an aqueous composition for CMP and a broad selection of abrasives including alumina, fumed alumina, and titania. The Office Action further states that Small teaches metal abrasive particles, which are catalysts, use of metal ions as catalysts, and a slurry comprising water having a pH of about 2-11. The Office Action points out that Small fails to use the units of mmol/kg of ions as defined in applicant's claims 1, 2, 3, and 10. The Office Action states that it would have been obvious to one of ordinary skill in the art at the time of the invention to convert weight percentage into molarity, and that the conversion of the amounts disclosed by Small would overlap the claimed concentrations.

Applicants respectfully disagree. Small teaches abrasives having a surface at least partially coated by a metal catalyst. Small states that the preferable catalyst is a metal acetate such as copper acetate or iron acetate. Small also offers that there is an interaction between the catalyst, that is coated on the abrasive, and the oxidizing agent in solution, and that the reaction takes place at the surface of the catalyst. This reaction, it is believed, generates free radicals or active reaction intermediates, such as free hydroxyl radicals, at the catalyst surface, which favorably interact with the targeted material on the substrate when the catalyst coating on the abrasive contacts the substrate surface. Furthermore, Small offers no quantitative parameter for the catalyst, only that it at least partially coats an abrasive that is present at about 0.5wt %. The Small invention requires that the catalyst be a solid on the surface of the abrasive and states the advantages over a "free" catalyst in solution (see paragraphs [0031], [0032] and [0062]). The present invention differs from Small in that the metal is present in an ionic form (i.e. in solution). The present invention also specifies the metal and concentration as being from about 0.05 to about 50 mmol/kg of ions of at least one metal selected from the group consisting of calcium, strontium, barium, and mixtures thereof, based on the total weight of the polishing composition. Small, therefore, teaches away both from a soluble metal ion and the types of metals specified by the present invention.

Cabot Microelectronics Corporation
870 North Commons Drive
Aurora, IL, 60504
Tel. (630) 375-5465

3/30/2006 Response to Office Action
U.S.S.N. 10/807,944

Page 3

The Office Actions states that Small teaches a slurry comprising water that has a pH of about 2 to 11, which overlaps the present invention. The Office Action further states that Small fails to teach the type of alpha particles being alpha alumina, but relies upon Sethuraman et al to teach that alpha alumina is conventional in CMP slurries. The Office Action asserts that it would have been obvious to select the pH range and the alpha alumina abrasive particles based upon the teachings of Small and Sethuraman.

Applicants respectfully disagree. While pH ranges between 2 and 11 encompass most CMP slurries, and alpha alumina is known as a slurry component, it does not suggest or motivate a person of skill in the art to the pH range or abrasive particle of the present invention, without prior knowledge of the applicant's invention. For the reasons mentioned above, Small teaches away from the present invention and therefore one of skill in the art would have been pointed in a different direction than the inventors of the present invention.

For at least the reason stated above, the applicants respectfully request that the rejections under U.S.C. 35 §103(a) be withdrawn. The applicants believe that the application is in good and proper form for allowance, and the Examiner is respectfully requested to pass this application to issue. If, in the opinion of the Examiner, a telephone conference would expedite the prosecution of the subject application, the Examiner is invited to call the undersigned agent.

Respectfully submitted,

By Thomas Omholt
Thomas Omholt
Reg. No. 37,052

Cabot Microelectronics Corporation
870 North Commons Drive
Aurora, IL, 60504
Tel. (630) 375-5465